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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BERNSHTEYN, MICHAEL

ART UNIT PAPER NUMBER

1713

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/660,186	Applicant(s) BECKLEY ET AL.	
	Examiner Michael Bernshteyn	Art Unit 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 7-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-10 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/12/03, 06/16/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-6, drawn to a mixture, classified in class 525, subclass 185.
- II. Claims 7 and 8, drawn to a method of reacting, classified in class 525, various subclasses.
- III. Claims 9 and 10, drawn to a method of applying, classified in class 156, subclass 60.

1. Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the product as claimed can be used in a materially different process of using that product such as applying the product to a first substrate and bonding said first substrate to a second substrate by curing the mixture.

2. Inventions I and III are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the product as

claimed can be used in a materially different process of using that product such as applying a layer of the product to a substrate and curing said mixture without contacting a second substrate to said layer.

3. Inventions II and III are related as independent inventions, each having a unique and separate means for establishing patentability. Invention II is directed to a method of reacting a mixture, where as Invention III is directed toward a method of applying and curing the mixture.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Stephen Johnson on November 15, 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-6. Affirmation of this election must be made by applicant in replying to this Office action. Claims 7-10 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Claims 1-6 are active in the Application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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6. Claims 2, 3 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is completely unclear from claims 2, 3, 4 and from the specification as to the meaning of the recitation "molecular weight". It is well known in the polymer chemistry that molecular weight can be weight average molecular weight or number average molecular weight, or something else. The applicant fails to provide the definition of "molecular weight".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rheinberger et al. (U. S. Patent 5,539,017) in view of Leake (U. S. Patent 6,521,716).

With regard to the limitation of instant claim 1, Rheinberger discloses the use of a thermally curable composition which contains (a) one or more β -dicarbonyl compounds as **Michael donors**, (b) one or more α,β -unsaturated carboxylic acid esters as **Michael acceptors**, the curing of the composition takes place in the presence of a catalyst base (c), the average functionality of the mixture comprising Michael donors (a) and Michael acceptors (b) being greater than 2 (abstract; col. 2, lines 22-23, 40-41 and 55-58).

Rheinberger discloses that the β -dicarbonyl compounds preferable usable as Michael donors (a) are acetoacetates and in particular those acetates which have 3 or 4 acetoacetoxy groups in which R^2 is hydrogen. Particularly preferred Michael donors (a) are **ethylene glycol-1,2- or hexanediol-1,6-bisacetoacetate, polyethylene glycol-600-bisacetoacetate**, etc. (col. 3 lines 2-18). The α,β -unsaturated carboxylic acid esters usable as Michael acceptors (b) are acrylic acid esters, which have 3 or 4 acrylate groups. Quite particular preferred Michael acceptors are **ethylene glycol**

diacrylate, hexanediol acrylate, tripropylene glycol diacrylate, ethoxylated bisphenol-A-diacrylate, polyethylene glycol-200-diacrylate, trimethylol propane triacrylate, pentaerythritol tetraacrylate, etc. (col.3, lines 18-30).

Rheinberger does not disclose that a curable mixture comprising at least one anion of a Michael donor, wherein said curable mixture comprises 5% or less by weight non-reactive volatile compounds, based on the total weight of said curable mixture.

Leake discloses a coating, adhesive or sealant composition curable by Michael reaction comprises (A) a Michael acceptor, which is a compound or polymer containing at least two activated olefinic double bonds and (B) a Michael donor which is compound or polymer containing at least two nucleophilic groups (abstract).

Leake discloses that his invention relates to a coating, adhesive and sealant compositions curable by Michael reaction, that is by addition of **an anion** derived from a nucleophilic group (**Michael donor**) to an activated carbon-carbon double bond (in **Michael acceptor**) (col. 1, lines 6-10). The cured materials are generally resistant to hydrolysis and degradation, particularly in the case where the Michael donor is an activated methylene group since the new bonds formed on crosslinking are C--C bonds (col. 1, lines 56-59).

Leake discloses that liquid polymers and oligomers can be crosslinked to form tough hard coatings, so that the coating composition need have **little or no volatile** organic solvent to achieve a viscosity suitable for spray application (col. 1, lines 50-54). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the addition of an anion derived from Michael donor

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with little or no volatile organic solvent, as taught by Leake, in Rheinberger's curable composition to obtain the composition curing by Michael reaction with several advantages: liquid polymers and oligomers can be crosslinked to form tough hard coatings, so that the coating composition need have little or no volatile organic solvent to achieve a viscosity suitable for spray application; the reactive groups involved in curing are less of a health and/or safety risk than most crosslinkable reactive groups, etc. (US'716, col. 1, lines 49-56), and thus to arrive at the subject matter of claim 1 of Application No. 10/660,186.

With regard to the limitation of instant claim 2, Rheinberger discloses that the β -dicarbonyl compounds preferable usable as Michael donors (a) are acetoacetates and in particular those acetates which have **3 or 4 acetoacetoxy groups** in which R^2 is hydrogen. Particularly preferred Michael donors (a) are ethylene glycol-1,2- or hexanediol-1,6-bisacetoacetate, polyethylene glycol-600-bisacetoacetate, etc. (col. 3 lines 2-18).

Rheinberger does not disclose that multifunctional Michael donor has a skeleton that has molecular weight 200 or greater.

With regard to the limitation of instant claim 2 in view of substantially identical Michael acceptors, Michael donors, catalyst base, process producing such products like Michael curable compositions used by Rheinberger, Leake and the applicant, it is the examiner position that the instantly claimed Michael curable composition is not necessarily different from the curable compositions of Rheinberger and Leake.

It is noted that the claiming of new use, new function or unknown property, which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 f.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977).

With regard to the limitation of instant claim 3, Rheinberger discloses that Rheinberger discloses that the used compositions are preferably cured in the presence of catalyst base, which is expediently added to a premix consisting of the selected Michael donors and Michael acceptors. Used as catalyst base (c) are preferably **alkali metal alkoxides**, tetraalkyl hydroxides, bicyclic amidines and guanidines (col. 3, lines 56-59, col. 4, lines 4-6).

With regard to the limitation of instant claim 4, Rheinberger discloses that when using dimethylacrylates or multimethacrylates, so-called **interpenetration network** (IPN) form, which impart an excellent hardness and strength to the cured compositions. Finally, methacrylates with acetoacetoxy groups, such as in particular 2-acetoacetoxy-ethyl methacrylate (AAEMA) can also preferably be used as modifying agents. By using such modifying agents, compositions with high hardness can be obtained (col. 4, lines 55-62). Improved adhesion or binding-in of the fillers into the **Michael polymer matrix** can be achieved by silanisation with acryloxyalkyl silanes (col. 5, lines 13-15). Two-stage-curing compositions based on an acrylate-acetoacetate/methacrylate mixtures were shown in Example 4 (col. 7 line 46 through col. 8, line 56). If modifying agents, which, in addition to the radically polymerizable groups, also have groups, which can be bound covalently into the polymer network, are added to the compositions, then particularly preferred compositions result (col. 8, lines 52-56).

Rheinberger does not disclose that Michael acceptor comprises a poly-functional (meth)acrylate of molecular weight 5,000 or less.

Leake discloses that a molecular weight in the range 600 to 5,000 is generally suitable as Michael acceptors in coating and sealant compositions (col. 10, lines 26-28).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the Michael acceptor with molecular weight less than 5,000 as taught by Leake in Rheinberger's curable composition in order to obtain coating and sealant composition curing by Michael reaction with several advantages: such composition need have little or no **volatile** organic solvent to achieve a viscosity suitable for spray application, the cured materials are generally resistant to hydrolysis and degradation, etc. (US'716, col. 1, lines 49-57).

With regard to limitation of instant claim 6, Rheinberger discloses that the concentration of catalyst base DBN (nonene) is 2.0 mol.%, the concentration of catalyst base DBU (undecene) is 0.2 mol.%, which are within the claimed range (Examples 1, 2 and 5, col. 6, lines 18 and 48, col. 8, line 64).

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rheinberger et al. in view of Leake and further in view of Dammann et al. (U. S. Patent 6,706,414).

The disclosure of Rheinberger and Leake references resided in § 7 is incorporated herein by reference.

With regard to limitation of instant claim 5, Rheinberger discloses that the mixture consisting of the β -dicarbonyl compounds (a) and the α,β -unsaturated carboxylic acid

esters (b) is selected such that the molar ratio of (a)/(b) is preferably 0.01 to 20 and particularly preferably 0.1 to 8 (col. 4, lines 7-10). For example, the molar ratio of the acrylate and acetoacetate group was 1:1 (Example 2, col. 6, lines 46-47).

Rheinberger does not disclose the reactive effective ratio of said curable mixture.

Dammann disclose the uncrosslinked liquid oligomeric compositions which are made by the Michael addition reaction of acetoacetate-functional donor compounds with multifunctional acrylate acceptor compounds where the equivalent ratios of multifunctional acrylate to acetoacetate vary from 1:1 to 13.2:1 depending on the functionality of both multifunctional acrylate and acetoacetate in the presence of a catalyst (abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ Dammann's teaching of reactive effective ratio in Rheinberger's curable composition because it is critical that an appropriate equivalent ratio of acceptor to donor is used in order to ensure that a liquid oligomeric product is obtained (US'414, col. 6, lines 53-56).

Thus, the combination of Rheinberger, Leake and Dammann renders instant claims *prima facie* obvious absent evidence of unexpected results commensurate in scope to the claims.

Conclusion

Other references used but not cited in this office include U.S. Patents 5,959,028, 6,706,414, 6,521,716, 6,011,114, 5,763,546, 5,945,489, 5,565,525, 6,025,410,


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6,673,851, 6,300,388, 5,539,017 and U.S. Patent Application Publication 2003/0165701 are shown on the Notice of References Cited Form (PTO-892).

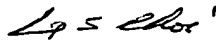
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Bernshteyn whose telephone number is 571-272-2411. The examiner can normally be reached on M-F 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Michael Bernshteyn
Patent Examiner
Art Unit 1713

MB
12/02/2005


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PRIMARY EXAMINER